CLAIMS

1. A test cell for solid-state specimens, comprising:

a housing,

a pair of electrodes positioned in the housing, and

a heating element coupled to the housing.

2. The test cell of claim 1, wherein:

the housing has (i) an outer surface, and (ii) a cavity,

the pair of electrodes is positioned in the cavity, and

the heating element is secured to the outer surface.

3. The test cell of claim 1, wherein the heating element is secured to an outer surface of the housing.

4. The test cell of claim 3, wherein:

the housing is cylindrical in shape with a flat defined in the outer surface thereof, and

the heating element is secured to the flat.

5. The test cell of claim 1, wherein the heating element comprises a resistor.

6. The test cell of claim 5, wherein the resistor is secured to an outer surface of the housing.

7. The test cell of claim 5, wherein:

the resistor is coupled to a current source, and

the resistor is configured to generate heat which is transferred to the housing upon application of current from the current source.

8. The test cell of claim 1, wherein the heating element comprises a plurality of resistors.

9. The test cell of claim 8, wherein each of the plurality of resistors is secured to an outer surface of the housing.

10. The test cell of claim 8, wherein each of the plurality of resistors is (i) coupled to a current source, and (ii) configured to generate heat which is transferred to the housing upon application of current from the current source.

11. The test cell of claim 1, further comprising a temperature sensor positioned to determine the temperature of a test specimen positioned between the pair of electrodes.

12. The test cell of claim 11, wherein the temperature sensor comprises a platinum resistor.

13. The test cell of claim 1, further comprising:

a cap secured to an open end of the housing, and

a cold-sink member secured to the cap.

14. The test cell of claim 13, wherein the cold-sink member comprises a metallic rod.

15. The test cell of claim 1, wherein the housing is metallic.

16. A test system for solid-state specimens, comprising a test cell having (i) a first electrode, (ii) a second electrode, and (iii) a heating element operable to heat a test specimen positioned between the first electrode and the second electrode.

17. The test system of claim 16, further comprising a current source, wherein the heating element comprises a resistor electrically coupled to the current source.

18. The test system of claim 17, wherein:

the test cell further comprises a housing having an outer surface and a cavity,

the first electrode and the second electrode are positioned in the cavity, and

the resistor is secured to the outer surface.

19. The test system of claim 17, wherein:

the test cell further comprises a housing, and

the resistor is secured to an outer surface of the housing.

20. The test system of claim 19, wherein:

the housing is cylindrical in shape with a flat defined in the outer surface thereof, and

the resistor is secured to the flat.

21. The test system of claim 17, wherein the current source comprises an R/G bridge.

22. The test system of claim 16, further comprising a current source, wherein the heating element comprises a plurality of resistors electrically coupled to the current source.

23. The test system of claim 22, wherein:

the test cell further comprises a housing, and

each of the plurality of resistors is secured to an outer surface of the housing.

24. The test system of claim 16, wherein the test cell further comprises a temperature sensor positioned to determine the temperature of the test specimen.

25. The test system of claim 24, wherein the temperature sensor comprises a platinum resistor.

26. The test system of claim 16, further comprising a cooling bath, wherein the test cell further comprises:

a housing,

a cap secured to an open end of the housing, and

a cold-sink member having a first end which is positionable in the cooling bath and a second end secured to the cap.

27. The test system of claim 26, wherein the cold-sink member comprises a metallic rod.

28. The test system of claim 16, further comprising an impedance meter electrically coupled to the first electrode and the second electrode.

29. A test cell for solid-state specimens, comprising:

a housing, and

a plurality of resistors coupled to the housing.

30. The test cell of claim 29, wherein:

the housing has (i) an outer surface, and (ii) a cavity,

a test specimen is positionable in the cavity, and

the plurality of resistors are secured to the outer surface.

31. The test cell of claim 29, wherein:

the housing is cylindrical in shape with a plurality of flats defined in the outer surface thereof, and

the plurality of resistors are secured to the plurality of flats.

32. The test cell of claim 29, wherein the plurality of resistors are configured to generate heat which is transferred to the housing upon application of current from a current source.

33. The test cell of claim 29, further comprising a temperature sensor positioned to determine the temperature of a test specimen positioned in the housing.

34. The test cell of claim 33, wherein the temperature sensor comprises a platinum resistor.

35. The test cell of claim 29, further comprising:

a cap secured to an open end of the housing, and

a cold-sink member secured to the cap.

36. The test cell of claim 35, wherein the cold-sink member comprises a metallic rod.

37. The test cell of claim 29, wherein the housing is metallic.

38. A method of testing a solid-state specimen, the method comprising the steps of:

positioning the solid-state specimen in a housing of a test cell, and

applying an electrical current to a number of resistors secured to the housing to heat the housing.

39. The method of claim 38, wherein the positioning step comprises positioning the solid-state specimen between a first electrode and a second electrode.

40. The method of claim 39, wherein the positioning step further comprises coupling the first electrode and the second electrode to an impedance meter.

41. The method of claim 38, further comprising the step of sensing the temperature of the test specimen with a temperature sensor.

42. The method of claim 41, wherein the applying step comprises adjusting the electrical current applied to the resistor based on output from the temperature sensor.